

# 5

## SUMMARY OF FINDINGS

This report has been organized into four chapters, including an introductory chapter and three chapters covering the broad topics of water quality, living resources, and human uses and management of resources. At the end of each chapter are summary lists of the significant finding within the chapter. No prioritization was made beyond separation of the listed, more significant findings from the rest of the information in the chapters.

This chapter presents the findings from the whole report in three tables that serve as a framework for prioritizing identified problems. Issues are listed and identified as either being a problem or not in Table 5.1. Their causes, impacts and locations are identified along with trends, solutions and agencies or organizations involved in

addressing the problems. The information in Table 5.1 is further distilled into a list of priority documented problems in Table 5.2. These problems are considered to be the most significant because impacts have been documented and either human uses or environmental quality are directly affected. Thus Table 5.2 serves as a summary of the highest priority problems that could be addressed through NHEP activities. Table 5.3 is a list of potential problems that have a lower priority for immediate action but could be significant in the future or under the right circumstances. The problems identified in these tables are presented in the same order in which they appear in the first four chapters. Review of the appropriate chapter will provide further details on any given problem.



J. PETERSON

*Storm drain stenciling.*

## ENVIRONMENTAL ISSUES AND TRENDS

Issue	Problem	Isolated Locations within NH estuaries	Throughout NH Estuaries	Impacts
<b>Water/ Sediment Quality</b> Microbial Pathogens/ Fecal Bacteria	Elevated concentrations	Cochecho R. Dry weather	Yes (during wet weather)	Public health risk and shellfish closures
Nutrients	Loading to some rivers	Salmon Falls & Cochecho Rivers	No	Intense blooms (Freshwater), isolated low dissolved oxygen (Salmon Falls River)
Trace metals: Chromium (Cr), Lead (Pb), Mercury (Hg)	Elevated concentrations in sediments	Cr (Great Bay), Hg (Piscataqua R.)	Pb	Unknown
Polyaromatic Hydrocarbons (PAHs)	Unknown	Little Bay, Piscataqua R.	Unknown	Unknown
Polychlorinated Biphenyls (PCB)	PCB residues elevated in lobster tomally		Yes	Lobster tomally consumption warning
Suspended Sediments	Unknown	Seasonal occurrences in tidal tribs to Great Bay & Piscataqua R.	Unknown	
Toxic Algal Blooms	Coastal		Throughout the Gulf of Maine	Shellfish closure (mussels), potential public health risk
<b>Living Resources:</b> Shellfish Oysters	Low oyster population densities, reduced bed area	Great Bay and tributary rivers	No	Loss of critical habitat, ecosystem functions, and economic activity
Soft Shell Clams	Decreasing density		Unknown	Loss of ecosystem function, and economic activity
Blue Mussels	Unknown		Unknown	Unknown
Scallops	Unknown		Unknown	Unknown
Lobsters	Catch stable, some die off			Some dead from oil, more from freshwater
<b>Finfish</b> Striped bass	No			
Winter flounder	Declining population, commercial and recreational catch		Throughout the Gulf of Maine	Loss of important commercial and recreational resource
Smelt	Unknown		Unknown	Unknown
River herring	Unknown		Unknown	Unknown
Shad	Decreasing returns		Unknown	Unknown
Silversides	Unknown		Unknown	Unknown
Infaunal Benthos	No			
Eelgrass		Little Bay, Rye Harbor		
Saltmarshes	Restricted tidal flow and changes in vegetation		Yes	Loss of salt marsh function
Macroalgae	Loss of habitat	Unknown	Unknown	Unknown

Documented	Trend	Suspected/Documented Causes	Potential Solutions
Yes	Decreasing	Stormwater, Waste water treatment facilities bypasses and malfunctions, possible failing septic systems, and possibly illegal direct discharges of septage	Point source identification, stormwater management, monitoring, local code enforcement and innovative treatment technologies
Yes	Unchanged	Waste water treatment facilities effluent, stormwater runoff	Reduce point source loading, stormwater management
Yes	Decreasing	Historical sources, stormwater, municipal and industrial discharges, and atmospheric deposition	Continued sediment and water quality monitoring
Yes	Down/episodic inc.	Stormwater, vessels, oil spills	Continued sediment and water quality monitoring and spill prevention
Yes	Decreasing	Historical discharges	Unknown
Yes	Decreasing 93-96	Resuspension by wind, waves, tides and ice	Continued sediment and water quality monitoring
—	Unknown	Circulation patterns and toxic algae distribution in the Gulf of Maine	Continued phytoplankton and water quality monitoring
Yes	Decreasing	Sediment accumulation, cultch removal, disease, and poor spatfall	Habitat restoration, disease monitoring, and resource management
No	Decreasing	Sedimentation, predation, disease and possibly harvest pressure	Habitat restoration, resource assessment and management
	Population increasing		None needed
	Unknown		Further research
Yes(oil), No (Freshwater)	Stable	Current management and existing capture methods	Continued management
Yes	Increasing	Good regional and local management	Continued management
Yes	Decreasing	Overharvesting in Gulf of Maine	Improve management and possible stocks enhancement
Yes	No trend, highly variable	Unknown	Continue stocks assessment
Yes	Some rivers up, other down	Unknown	Continue stocks assessment
Yes	Decreasing returns	Possibly overharvest or predation	Continue stocks assessment, and examine stocking program
Yes	Insufficient data	Unknown	Consistent stocks assessment
Yes	Stable		Periodic monitoring
Yes	Increasing since 1989	Increased resource protection, recent lack of disease outbreaks, restoration efforts	Continued protection, monitoring, restoration and mitigation
Yes	Increase in restored marsh acreage	Restoration of tidal flow and reduction in freshwater volume through stormwater management	Continued restoration and stormwater management
No	Possibly increasing	Possible local excess nutrients	Research and monitoring

Issue	Problem	Isolated Locations within NH estuaries	Throughout NH Estuaries	Impacts
Phytoplankton	Late summer blooms during low flow periods	Salmon Falls River	No	Low dissolved oxygen-Salmon Falls River
Freshwater Wetlands	Loss of wetland acreage (some local gains)		Yes	Loss of wetland habitat and function
Other Waterfowl	No		Yes	
Eagles	No		Yes	
Terns	Limited breeding in NH	Nearshore islands, coastal salt marshes	No	Lower seabird diversity
Ospreys	No	Great Bay	No	
<b>Other Issues</b> Shoreline Habitat	Loss of shoreline habitat acreage		Yes	Potential for decreased water quality, loss of habitat function
Upland Habitat	Loss of upland habitat acreage		Yes	Potential for decreased water quality, loss of habitat function
Conservation Lands	Acquisition of land and conservation easements for open space and habitat preservation		Yes	Protection/loss of habitat
Impervious Surfaces	Increased area of impervious surfaces		Yes	Water quality degradation, increased stormwater runoff volume and velocity, loss of habitat
Shipping	Potential for spills and discharges	Piscataqua River	No	Oil spills and ballast water contaminants
Boating	Potential for spills, discharges and habitat disruption		Yes	Illegal waste discharge, habitat destruction, other contaminants (debris, oil&gas)
<b>Commercial fishing</b> Finfish	Declining stocks		Throughout the Gulf of Maine	Tremendous economic impact and ecosystem alterations
Lobsters	Increasing Fishing effort		Yes	
Anadromous fish	Unknown		In all estuarine rivers	Restoration of spawning habitat and improved access to habitat
Dredging	Resuspension of potentially contaminated sediments; loss of eelgrass	Cocheco River Little Bay	No	Re-introduction of historical contaminants to the estuarine environment

Documented	Trend	Suspected/Documented Causes	Potential Solutions
Yes	Unchanged	Phosphorus in waste water treatment plant effluent (low flow periods) and stormwater runoff	Phosphorus removal and stormwater management
Yes	Decreasing acreage overall	Acreage decreasing due to road construction and residential and commercial development. Increased beaver population may create new wetland areas, often at expense of surrounding upland properties	Protection, mitigation
Yes	Increasing	Habitat protection, restoration and resource management	Continued protection, monitoring, resource management and habitat restoration
Yes	Variable, possibly increasing seasonal population	Species preservation and habitat protection	Continued preservation, protection and monitoring for environmental risk factors
Yes	Increasing	Breeding colony being re-established	Continued preservation, protection and re-colonization efforts
Yes	New nesting sites	Establishment of nesting platforms	Continued preservation, protection and monitoring for environmental risk factors
Yes	Acreage lost is Increasing (rate unclear)	Residential and commercial development, increase in impervious surfaces generating contaminated runoff	Establishment of riparian buffers, local zoning, various land protection and habitat restoration strategies, property owner education
Yes	Increasing	Residential and commercial development, increase in impervious surfaces generating contaminated runoff	Local zoning, various land protection and habitat restoration strategies, property owner education
Yes	Increasing	Growth, development and land use practices reducing habitat values and functions	Continued land purchases and conservation easements on local and regional levels
Yes	Increasing	Residential and commercial development, road construction	Local zoning, various land protection and habitat restoration strategies, property owner education
Yes	No trend	Result from accidents and operator error. Ballast water discharge is a routine function.	Improved accident prevention, oils spill response and potential treatment of ballast discharge
Unknown	Increasing/stable	Lack of facilities, boater ignorance of consequences of their actions	Education, pumpouts
Yes	Decreasing fish stocks	Overharvesting and habitat destruction	Comprehensive management strategies, stocks enhancement, potential for aquaculture
Yes	Stable	Current management and existing capture methods	Continued management
Yes	Increasing	Fish ladders, destruction of spawning habitat, and predation	Continued management, research and restoration activities
Yes	Unknown	Contaminant from historical and current sources buried in sediments	Research, continued dredge management

Table 5.2

*NHEP Priority Problems List: Documented Problems.*

Problem	Cause	Impact	Location Affected
<b>CONTAMINANTS</b>			
Elevated concentrations of microbial pathogens	Stormwater, CSO's, septics, WWTP's (bypasses, infiltration), boats and illegal connections	Shellfish bed closures Potential public health risk	Great Bay- Tidal rivers under all conditions systemwide in wet weather Hampton- Tidal creeks Tidal creeks under all conditions systemwide in wet weather
Elevated sediment and biota concentrations of trace metals (Cr, Pb, Hg)	Historical, municipal and industrial effluents, atmospheric deposition, Stormwater	No recent observations	Localized hotspots: Cocheco, Lamprey, Exeter rivers, PNS Systemwide means > regional means
Elevated concentration of PCB in lobster tissue	Unknown/historical discharges?	Consumption advisory	Systemwide and regional
Nutrient loading	WWTP's effluent exacerbated by low f.w. flow	Intense Plankton Blooms depressed oxygen	FW and isolated tidal portions of Cocheco and Salmon Falls rivers
<b>LIVING RESOURCES</b>			
Declines in oyster populations	Sedimentation, disease, loss of cultch, poor recruitment	Loss of valuable habitat Loss of ecosystem function Loss of harvesting opportunities	Systemwide
Decreased clam density, boom and bust fishery	Predation, harvest pressure, poor recruitment, mussel colonization, disease (?)	Loss of valuable habitat Loss of ecosystem function Loss of harvesting opportunities	Systemwide and regionwide
Declining flounder populations	Harvest pressure in Gulf of Maine Predation(?) by bass, cormorants	Loss of harvesting opportunities	Regionwide
Degraded saltmarshes	Reduced tidal flow, development	Change in vegetation	localized areas (identified by NRCS)
Declines in alewife returns	Unknown	loss of important forage species	Taylor River, Exeter River

Problem	Contaminants	Cause	Potential Impact(s)	Locations Potentially Affected
Nutrient enrichment		WWTP's, stormwater and NPS (lawn fertilizer, septics)	Algal blooms, macroalgal proliferation, low DO, eelgrass loss, decreased clarity	Tidal: Exeter/Squamscott* Lamprey (?) Impoundments in freshwater rivers
Toxic contamination		Dredging Cocheco River	redistribution of chromium & PAHs	Cocheco & Piscataqua rivers
Oil spills		Accidents	Lethal and sublethal affects	Piscataqua River and systemwide
Other Issues				
Increase in impervious surfaces		Development	Change in quantity and timing of delivery of stormwater  Potential for increased contamination	Systemwide
Loss of riparian habitat		Development	Potential for increased contamination	Systemwide
Freshwater wetlands loss		Development	Potential for increased contamination  Loss of flood control function	Systemwide
Changes in circulation patterns		Dredging	tidal flat erosion	Hampton Harbor (Seabrook)